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MEMORIALS

Harold Lattimore Alling ..... DAVID E. JENSEN 471

Ciro Andreatta ..... PAOLO GALLITELLI 475

Harold Eugene Buckley ..... W. A. DEER 481

Burnham Standish Colburn ..... WALDEMAR T. SCHALLER 485

Austin Burton Edwards ..... FRANK L. STILLWELL 489

John Tipton Lonsdale ..... E. WM. HEINRICH 497

Graham Stewart MacKenzie ..... W. E. HALE 501

AWARDS

Presentation of the Roebling Medal to Tom. F. W. Barth ..... GEORGE TUNELL 505

Acceptance of the Roebling Medal ..... TOM. F. W. BARTH 509

Presentation of the 1960 Mineralogical Society of America Award to Donald L. Graf ..... JULIAN R. GOLDSMITH 511

Acceptance of the Mineralogical Society of America Award ..... DONALD L. GRAF 513

Proceedings of the Forty-first Annual Meeting of the Mineralogical Society of America 516

HAROLD LATTIMORE ALLING
1888–1960

THE AMERICAN MINERALOGIST, VOL. 46, MARCH-APRIL, 1961

MEMORIAL OF HAROLD LATTIMORE ALLING

DAVID E. JENSEN, *Ward's Natural Science Establishment, Inc., Rochester, New York*

Harold Lattimore Alling, former Vice-President of our society, passed away at his home in Pittsford, New York on July 27, 1960. Though he had been hospitalized with cancer for several weeks, he was able to review a part of the manuscript of his latest papers two days before he died.

The son of Joseph Tilden Alling and Rose Lattimore, he was born in Rochester, New York on Feburary 7, 1888. His grandfather on his mother's side, Samuel Allan Lattimore, was Professor of Chemistry in the University of Rochester for forty-two years. His father was for many years Chairman of the University's Board of Trustees.

After graduation from Rochester's East High School, he entered the University of Rochester where he first became especially interested in physics, taking advanced work in addition to all of the available courses. At the suggestion of his grandfather, Professor Lattimore, he diverted his chief interest to geology and in 1915 he received his B.S. degree from the university with honors in geology.

The Alling family used to spend their summers at their camp near Keene Valley in the Adirondack mountains. It was quite natural, therefore, that, with the stimulating guidance of Professor H. L. Fairchild, Harold Alling's first published paper would be on glacial lakes and other glacial features of the central Adirondacks.

One summer he learned that Professor James Kemp of Columbia University was doing field work near Keene so he volunteered his services as Professor Kemp's field assistant. This association firmly established a lively and lasting interest in the geology of the Adirondack region. It also influenced him to enter Columbia University for graduate work. There he studied under Professors Kemp, Berkey, and Colony obtaining his A.M. degree in 1917 and his PhD. in 1920.

From 1917 to 1920 he served as geologist for the New York State Museum. During the first world war, he was engaged in the investigation of war materials under the direction of the National Research Council. A thorough survey of the Adirondack graphite deposits was made in the course of this work in the summer of 1917. The results of this study were published as a bulletin of the New York State Museum in 1918.

The graphite studies could have adequately served for his doctorate at Columbia University but he had become intensely interested in the physical chemistry of the feldspars. Thus the mineralography of the feldspars became the topic of his doctorate.

In 1920 Dr. Alling returned to the University of Rochester as instructor in geology, advancing to assistant professor in 1923 and becoming professor in 1924, and chairman of the Geology Department from 1924 to 1946. He retired in 1953. He had a large part in the planning of the geology wing of the Chester Dewey Building on the River Campus of the University which was opened to students in the fall of 1930. Many of the good features of this building were soon sought for incorporation in geology departments elsewhere in the country.

Dr. Alling was an inspiring teacher. He had the facility of using simple, everyday examples to get a point across. He was especially generous with his time and knowledge in helping graduate students and often aided them financially. He was a tireless researcher in the field and in the laboratory. His contributions to geologic literature number over 45 papers and books. He was an enthusiastic photographer and made hundreds of photomicrographs of minerals and rocks that often illustrated his publications.

From 1931 to 1940 Dr. Alling was a Director of Ward's Natural Science Establishment, Inc. To this post he brought wise counsel and suggestions for the development of teaching aids. Along the latter was a series of geomorphological models which are being used in teaching elementary geology in all parts of the world.

He was a Fellow of the Mineralogical Society of America and served as its Vice-President in 1936. He was a Fellow and Life Member of the Rochester Academy of Science serving as Secretary in 1920–1921. From 1927 to 1932 he was Chairman of the Feldspar Committee of the National Research Council; Trustee of the Natural Science Association of the Catskills, 1945–1949; and Director of the Alling & Cory Co., 1938–1945; Fellow, American Geophysical Union.

His scientific affiliations were numerous. He was a Fellow of the American Association for the Advancement of Science, the Geological Society of America, and the New York Academy of Science. He was a member of the Seismological Society, the Society of Economic Paleontologists and Mineralogists, New York State Geological Association (President 1932, 1941), American Institute of Mining, Metallurgical and Petroleum Engineers, the Geochemical Society, and the Rochester Section, American Chemical Society, and the New York State Archeological Society. He was a member of Psi Upsilon and Sigma Xi.

On August 23, 1922, he married Merle Koib who survives with three children, Joanna Tilden (Mrs. James D. Secrest), Rosamund Lattimore (Mrs. Philip J. Secrest) and Norman Larrabee Alling.

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MEMORIAL OF CIRO ANDREATTA

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Ciro Andreatta died on Feburary 6, 1960 after a short illness. He was Professor of Mineralogy at the University of Bologna, and a Fellow of the Mineralogical Society of America. He was born in Pergine in the Province of Trento on January 23, 1906, and graduated from University of Padova in 1928 with a degree in Natural Sciences. He remained there as a graduate student (1929) and as an assistant (1930–1936) in the department of Mineralogy and Petrography.

In 1932 he became a docent in Mineralogy and attended for a year the Institute of Mineralogy and Petrography at the University of Innsbruck, where under the guidance of Bruno Sander, he studied the fundamental principles of modern structural rock analyses while also undertaking some original research of his own. In 1936 he was appointed Professor of Mineralogy at the University of Messina where he remained until he was called to the Chair of Mineralogy at the University of Bologna in 1938. He remained there without interruption till his premature death. He participated intensely in scientific activities, and from 1953 on directed the "Centro di Petrotettonica" of the National Council of Research. In 1959 he was elected chairman of the Science Department at the University. In the years between 1938 and 1959 there were also other executive responsibilities: he was the representative of the academic faculty in the University's Administrative Council. For his scientific merits, the National Academy of Lincei awarded him with the National Prize for Mineralogy in 1951. He was correspondent of the National Academy of Lincei, of the Academy of Science in Vienna and of the Geological Society of America; he was a Fellow of the Mineralogical Society of America; a member of the Mineralogical Society of London, of the Deutschen Mineralogischen Gesellschaft, of the Swiss Society for Mineralogy and Petrografy and of the Società Mineralogica Italiana of which he was also a President from 1955 to 1957. He was the Italian delegate in the "New Minerals" Commission of the International Mineralogical Association.

His scientific activity, as represented in more than one hundred publications, began in 1928 with a series of research studies on Alpine minerals, such as chalcopyrite, pickeringite, and arsenopyrite (of this he described some rare twins). Others studies concerned bianchite, a new hydrated sulfate of iron and zinc, which was observed for the first time in the caves of Predil, and dannermoite in the Valley of Peio.

However, Professor Andreatta performed the major part of his vast and intense studies in the petrographical research field where he emerged

CIRO ANDREATTA
1906–1960

as a master because of his brilliant qualities of observation as well as his profound knowledge of the optical phenomena of minerals. These qualities enabled him to solve through modern criteria many geological and petrographical problems and also develop applications of Sander's petrotectonics of which he was the most qualified expounder in Italy.

His first petrographical works, among which a noteworthy one is "Ricerche Petrografiche sulla regione di Cima d'Asta," were followed by a large amount of research regarding the orientation of various minerals in metamorphic rocks. On the basis of this he established the orientation rule of olivine, cyanite, and anhydrite, of the "formazione dioritica Kinzigitica" of Val d'Ultimo and the crystaline rocks of Peloritani. But his most significant contribution was the series of studies regarding rocks of the Ortles Mountain area, extending for approximately 1800 square kilometers and containing mountain peaks close to 4000 meters high, of which he had completed a geological and petrographical survey and on the basis of which he succeeded in solving with modern criteria geological and petrographical problems using with originality the concepts of Petrotectonics. Within this general line of inquiry must be mentioned his work on polymetamorphism, as well as on the mobilization and on the movements of matter which accompany tectonic metamorphism, and on the phenomena of granitization. In the last few years he had been actively working on other research projects, some of which have not yet been completed. Among these is the study of the porphyritic formations of Val d'Adige—a work on which he left numerous manuscripts, chemical analyses and observations which testify to his intense activity in this area.

Other works concern the clay minerals of Puglie, in the area of Viterbo, on the Vicenza Alps, and on the mechanism of reticular degradation of feldspar and the transformation of mica into montmorillonite through hydromica. Finally there are some studies of ore deposits in the region of Venezia Tridentina; in these studies the late Professor Andreatta indicates very clearly the genesis of these ores, with regard to the geological history of the imbedded rock formation.

Worthy of mention is also the excellent text book of mineralogy and crystallography prepared for the students attending the courses of natural and geological sciences; this volume undoubtedly has high place among Italian texts on mineralogy.

These are briefly the great merits of Ciro Andreatta which put him in a high place among contemporary Italian mineralogists. But those who have known him cannot forget that in addition to being a valiant and good scholar he was also a good, simple and reserved man who spoke rarely, but always incisively—the man who was close to his family.

A man who was so sensitive that in the moments of solitude he could portray his mountains of Trentino with a paint brush. He was the tireless man who was able to inspire enthusiasm and affection in his numberless students who will always remember him with high regard.

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MEMORIAL OF HAROLD EUGENE BUCKLEY

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By the death, after a long illness, of Harold Eugene Buckley on 30th August, 1959, Britain lost one of its outstanding crystallographers. Born on 19th November, 1897, at Bolton, Lancashire, Buckley attended the local primary school and later Bolton Grammar School. During the First World War he served in France initially with the Grenadier Guards and later, on being commissioned, with the Loyal North Lancashire Regiment. On demobilization Buckley entered the Honours School of Chemistry in the University of Manchester, graduated in 1921 and took his master's degree the following year. At this time Sir Henry A. Miers was Vice-Chancellor of the University and it was due largely to his influence that Buckley was attracted to work in the field of crystallography. Buckley was appointed assistant to Miers in 1923 and although his earlier work was primarily concerned with the optical anomalies in a series of isomorphous double tartrates it was apparent that his main interests were in the growth, and the mechanism of growth, of crystals. On Miers' retirement in 1926 Buckley was appointed to a newly established Lectureship in crystallography, an appointment which although loosely associated with the department of physics allowed him the freedom of an independent unit within the Faculty of Science. His absorbing interest in crystal growth was thus able to develop unfettered along the lines which he himself planned. Buckley's attitude to crystallography was from the beginning highly individual and his independent approach, so characteristic of the man himself, was heightened by his conscious intention not to become a mere appendage of the Bragg school of *X*-ray crystallography.

In the thirties his work on the effects of ionic impurities on the growth of crystals was pursued with the greatest vigour and during this period he published in the Zeitschrift für Kristallographie some twenty papers which contain a wealth of detail on the experimental modification of crystal habit. The regularity of publication and the constancy with which his work appeared in the Zeitschrift were typical both of Buckley's zeal and of his fierce independence. His earlier work had been published in the Mineralogical Magazine but shortly, as the result of a disagreement with the editor, the late Dr. L. J. Spencer, he declared and carried out his intention in future to publish elsewhere. There is no doubt that by some of his colleagues Buckley's work was considered to be outmoded by the methods of *X*-ray crystallography. This attitude, however, served

HAROLD EUGENE BUCKLEY
1897–1959

only to strengthen his resolve to pursue his investigations which at this time were unique among British crystallographers.

It is unlikely that Buckley himself foresaw the magnitude of the interest in crystal growth which developed during the Second World War, or of the great increase in the needs of the telecommunications and electronics industries for large clear crystals of substances with specific physical properties. During the early stages in the development of this new crystal-growing industry Buckley's experience and knowledge was invaluable and the successful beginnings of commercially grown crystals in the United Kingdom were in no small measure a consequence of the readiness with which he shared his knowledge with all who sought his advice. The lack of a comprehensive account of crystal growth and dissolution phenomena in English rendered Buckley's service the more valuable, but the awakened interest in both the experimental and theoretical aspects of the subject emphasized the urgent need for a general textbook. In this field also it was Buckley who filled the breach and his book, Crystal Growth, was published in January, 1951. This work which at the time of publication was the most complete and modern account of the theory and practice of crystal growth is now generally accepted as the standard text in this subject.

Buckley was essentially a researcher but each year he gave a lecture course in crystallography. He was, however, unable to appreciate the extent of the gulf between his knowledge and enthusiasm and that of the undergraduate; consequently few students voluntarily attended his classes and many went away without appreciating either the usefulness or the elegance of crystallographic methods and techniques. To the research student, and to his colleagues, Buckley presented a very different picture for he was always ready to give unlimited time and patience to those who brought their problems to him.

His university recognised Buckley's academic distinction firstly by his appointment to a Senior Lectureship in 1937 and finally to a Readership in 1952. He was elected to Fellowship of the Mineralogical Society of America in 1947. To those who knew him Buckley will be remembered not only for the work he accomplished but also for the manner of its achievement based as it was on his fierce independence, great integrity and complete singleness of purpose.

He leaves a widow and four sons, the two eldest of which he had the the pleasure of seeing graduate in his own university.

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MEMORIAL OF BURNHAM STANDISH COLBURN

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Burnham Standish Colburn was born in Detroit, Michigan, December 10, 1872, and died in his home in Asheville, North Carolina, December 26, 1959. He was a descendant of Miles Standish, John Alden, Edward Doty, and Richard Warren, of the Mayflower, and had served at one time as Governor General of the General Society of Mayflower Descendants. On November 21, 1900, he married Elizabeth G. Pierce, who died on January 12, 1959. He is survived by his brother, William B. Colburn, a son, Burnham Standish Colburn, Jr., three daughters, Elizabeth (Mrs. E. Wayford Willmar), Evelyn (Mrs. Evelyn C. Thorn), and Mary Louise (Mrs. J. Frazier Glenn, Jr.), and several grandchildren.

Mr. Colburn received his B.S. in civil engineering at the University of Michigan in 1896. His first serious interest was in bridge building, but it soon veered to banking and from 1911 to 1913 he was vice-president of the People's State Bank in Detroit. Later he was Treasurer of the Biltmore Estate Company, and from 1933 to 1953, President of the First National Bank and Trust Company of Asheville, North Carolina, where he had moved during the First World War. His interest in minerals apparently dated from his childhood, his father having owned a large iron mine. Soon after moving to Asheville, he became acquainted with Joseph Hyde Pratt, State Geologist of North Carolina. He soon acquired a collection of North Carolina minerals that was rated as the finest collection of its kind in the country, and a part of it was the Pratt collection, particularly rich in gemstones from North Carolina. His interests centered in the southern Appalachian region, and the Spruce Pine area, with the many dumps at abandoned mica mines and at the operating mines, yielded him many good specimens. Among these were specimens from the old emerald mine near Little Switzerland, the rare pitchblende from Penland with its gaily colored alteration products, thin red garnets enclosed in sheets of mica, and sheets of white mica with included crystals of black mica and vice versa. These last were exhibited as transparencies in the windows of his mineral room. Many other nearby localities intrigued him immensely—Corundum Hill, Shooting Creek, Cowee Creek, Mason Mountain. Perhaps his greatest "field excursion" was his reopening, at great personal expense of both time and money, of the famous old hiddenite mine near Stony Point.

Most of his collection was purchased in 1945 by friends and alumni of the University of South Carolina and presented to the university for permanent exhibition in the Geology Department, as it was his wish that the collection should be kept intact in a place where it would be

BURNHAM STANDISH COLBURN
1872–1959

available to all. The specimens that he kept for himself at that time, to show to those who were interested, have now been donated by his family to form the nucleus of the Burnham S. Colburn Memorial Mineral Museum at 170 Cove Avenue, Asheville, sponsored by the Southern Appalachian Mineral Society, founded by Mr. Colburn.

Mr. Colburn became a member of the Mineralogical Society of America in 1930. In December 1936, in recognition of his lifelong interest in minerals and his great kindness and generosity to amateurs and professionals alike, he was elected a Fellow. He served as Vice-President for the year 1939.

The writer is one of many who enjoyed and benefited greatly by knowing this charming gentleman and his most hospitable family. No finer tribute could be written about him than to quote the statement recorded when the Southern Appalachian Mineral Society was formed (and probably written by Mr. Colburn himself)—"The objects of this society are to promote good fellowship and better acquaintance among its members, to add to the available information regarding mineral deposits of both commercial and museum value, to make such information readily accessible to the members, and to foster a free interchange of ideas."

In noting his passing, the Southern Appalachian Mineral Society recorded the following appreciation, "He welcomed friend and stranger to his home and to his office. He discussed minerals, he gave away specimens, he loaned books, he did all he could to foster knowledge and interest in the mineral world."

AUSTIN BURTON EDWARDS
1909–1960

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MEMORIAL OF AUSTIN BURTON EDWARDS

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Austin Burton Edwards Ph.D. (Lond.), D.Sc. (Melb.), D.I.C., M.A.I.M.M., was born in Melbourne in 1909 and educated at the Caulfield Grammar School where he was captain and dux in 1926. In 1927 he commenced a science course at the University of Melbourne, became a University half blue in football and graduated B.Sc. in 1930 with first class honours in Geology. He was awarded the Howitt Natural History Scholarship in Geology and later a Bartlett scholarship and then studied the geology and petrology of the Black Spur area, Healesville. This was the subject of the first of 128 published contributions to geological science with which Dr. Edwards is identified either as sole or joint author. His second paper was a similar study of the Warburton area where the mountainous terrain gave full scope to his enthusiasm and physical strength. These researches gained for him an 1851 Exhibition and enabled him, with the award of a free passage to England, to continue his studies at the Imperial College of Science in London. Here he gained his Colours in athletics during his course of study on the Tertiary volcanic rocks and dykes in South Gippsland and Central Victoria for which he was awarded a Ph.D. in 1934.

He then chose to return to Australia and accepted an appointment as research officer in the Mineragraphic Section of C.S.I.R. which was then housed in, and closely identified with the Geological Department of the University of Melbourne. Thus commenced an association with Dr. F. L. Stillwell which became widely known through reports and publications and which endured, notwithstanding occasional attractive offers from overseas and elsewhere. There followed a series of studies of Australian ores and ore deposits which was extended to the examination of mill products and mill tailings and eventually to smelter products such as mattes, speisses and slags.

His first independent Mineragraphic task was the study of the occurrence of Mn in iron ore of Iron Knob in South Australia. He extended this into a study of the iron ores of the Middleback Ranges. This was the first of a series of studies of iron ores which culminated in the recognition and discovery of the oolitic iron ores in the Northern Territory and Constance Range in Queensland.

At the same time he sustained a keen interest in petrological problems and completed at spare intervals various papers which he had initiated in London, of which the more important were his studies on the Tertiary Volcanic rocks of Central Victoria and the Differentiation of Dolerites

of Tasmania. In 1937 he shared the David Syme Research Prize awarded by the Melbourne University with Professor R. D. Wright. He gained his Doctorate of Science in 1942.

On the retirement of Professor Skeats from the chair of Geology at the University of Melbourne in 1941 he was invited to lecture to the students on Mining Geology, pending the appointment of a lecturer in Economic Geology. These lectures, which continued till 1953, aroused his interest in Victorian coal and a series of papers on Wonthaggi and Victorian brown coals originated which eventually elevated him to a position of authority on brown coal and resulted in a request from the State Electricity Commission to act as geological consultant for them. He was given permission by C.S.I.R.O. to accede to the request and the fees for consulting were, by arrangement with C.S.I.R.O., allocated for the purchase of equipment for the Mineragraphic Section.

In 1946 a special post-graduate course was provided by the Geological Department of the University of Melbourne for eight Indian graduates. Dr. Edwards contributed to this course a series of lectures on mineragraphy and ore textures. These lectures provided the basis for his book entitled "Textures of Ore Minerals" which was published by the Australasian Institute of Mining and Metallurgy in 1947. This publication met with world wide success and a demand for it in mining schools and universities quickly exhausted the first edition. Dr. Edwards then prepared a new and enlarged edition which appeared in 1954 and has been followed by a reprinting in 1960. Ore minerals and their textures was the subject chosen by Dr. Edwards for the Clarke Memorial Lecture which he was invited to give to the Royal Society of New South Wales in 1952. The last honour received by him was the award of the Clarke Memorial Medal of the Royal Society of New South Wales in 1960.

In preparation for the Fifth Empire Mining and Metallurgical Congress in Australia in 1953 Dr. Edwards initiated a symposium on the Geology of Australian Ore Deposits. It was organised by a committee appointed by the Australasian Institute of Mining and Metallurgy with Dr. Edwards as chairman. The result was a volume comprising 135 articles contributed by the leading geologists in the Commonwealth which were edited by Dr. Edwards with the gaps filled in with his own editorial contributions. Consequent on this work Dr. Edwards served as assistant editor of the Proceedings of the Institute until his departure overseas.

In 1953 Dr. Edwards became Officer-in-Charge of the Mineragraphic Section when Dr. Stillwell reached the retiring age. The Section had moved out of the Geology building of the University in 1949 for new quarters in an adjacent building shared with the Commonwealth Department of External Affairs and the University Appointments Board. When

the Commonwealth Department of Migrant Education vacated this building for larger premises Dr. Edwards was able to acquire further space to accommodate his increased staff and equipment.

Gradually over the years the scope of work undertaken by the Mineragraphic Section widened and in addition to the study of ores, igneous rocks and coal Dr. Edwards made contributions to sedimentary petrology, geochemistry, meteorites and geomorphology. The sedimentary petrology commenced with a study, jointly with G. Baker, of the Jurassic arkoses in Victoria and continued when the Mineragraphic Section was requested to examine the Mesozoic and Tertiary sediments of the Aure Trough, Purari Valley and the Wahgi Valley in Papua. His interest in geochemistry arose in the last few years from studies of the selenium content in sulphide deposits and the distribution of cadmium, manganese and iron in Broken Hill sphalerites. His descriptions of meteorites were a natural extension of his mineragraphic work, while his interest in geomorphology absorbed him during his vacations.

From 1953 onwards he was a member of the Council of the Australasian Institute of Mining and Metallurgy and, since 1949, a member of the Council of Caulfield Grammar School. His early interest in football was revived in later years when he accepted office as Vice-President of the University Football Club and coached the University Third football team for six years.

Honours that came to him from overseas included a Corresponding Fellowship of the Edinburgh Geological Society, nomination as Observer for 1958/61 for the Commission on Geochemistry of the International Union of Pure and Applied Chemistry, and election as a Foreign Member of the Mineralogical Society of India.

His overseas tour in 1960 to the mining fields in Europe and the centres of mineralogical research had been carefully planned even to the extent of acquiring some acquaintance with spoken Italian. He left with his wife on August 25th and travelled by air to Athens and after visiting some mines in Greece he moved on to Italy. His Italian tour was nearly completed when he collapsed and died in hospital in Rome. He was buried in the Protestant cemetery in Rome. He is survived by his wife, three daughters and a son.

With his death Australian geological science suffers the loss of an outstanding, unusually versatile and highly productive scientist whose clear thinking and rapid grasp of a problem was a constant help and guide to all associated with him. The loss of so brilliant and energetic a scholar at the height of his career is most keenly felt, both throughout Australia and overseas.

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THE AMERICAN MINERALOGIST, VOL. 46, MARCH-APRIL, 1961

MEMORIAL OF JOHN TIPTON LONSDALE

E. WM. HEINRICH, *Mineralogy Department, University of Michigan.*

John T. Lonsdale died suddenly and unexpectedly of a heart attack on October 5, 1960 at 1:30 A.M. at his home in Austin, Texas. To those who never knew him this can be read as a simple statement of fact. For those of us who knew him and thus loved him no amount of repetition will ever convince us that it is completely true.

Who can portray a man by parading the sequence of his life events? John Tipton Lonsdale, born November 8, 1895 at Dale, Iowa was the oldest son of John Dye Lonsdale and Eva Mary Lonsdale, nee Connor. After an elementary school education at Dale and high school training at Guthrie Center, he was awarded his B.A. (1917) and M.S. (1921) at the University of Iowa. His studies were interrupted from 1917 to 1919 when he served as First Lieutenant in the Army of the United States during which time he was cited for bravery by both the United States and Italian governments.

Upon his return from war he married Edna Gertrude Von Arnam on August 13, 1921. Mrs. Lonsdale recalls a long personal debate in deciding whether to resume with geology or to continue as a professional military man; he had received a commission as a first lieutenant in the post-war army. Geology won and he began his professional career as Assistant Professor of Geology at the University of Virginia and Assistant Geologist with the Geological Survey of Virginia (1921–1924). The Degree of Doctor of Philosophy in Geology was awarded him by the University of Virginia in 1924.

At the University of Oklahoma he served as Assistant Professor of Geology in 1924 and continued as field geologist for the Oklahoma Geological Survey in the summers of 1924 and 1925. His career with the Texas Bureau of Economic Geology began in 1925 when he became associate geologist, rising to geologist in 1927. From 1928 to 1935 he was Professor of Geology and chairman of the geology department at Texas A. and M. College, a combination of posts he also held from 1935 to 1942 at Iowa State College. While at College Station, Texas, he was also geologist for the Missouri Pacific Railroad. He returned to military service from 1942 to 1945 as Lieutenant Colonel and Colonel, General Staff Corps and continued as a colonel in the U. S. Army Reserve until 1953.

In 1945 he was recalled to become Director of the Texas Bureau of Economic Geology and Professor of Geology with graduate rank, positions he held at the time of his death. To the complex duties of this demanding situations he brought devotion, energy, intelligence and good judgement, efforts that rapidly placed the Bureau into the foremost

JOHN TIPTON LONSDALE
1895–1960

ranks of state geological surveys. His own geological interests centered around petrology, ground water, and economic geology. Special mention should be made of his initiation of a comprehensive investigation of the mineral resources of the State of Texas and of his painstaking and original studies of the igneous rocks of the Big Bend National Park, the Terlingua-Solitario region and the Balcones fault region. His geological interests were catholic, his strivings devoted, his achievements valid.

The scientific and honorary societies which he faithfully served were many: Sigma Gamma Epsilon, Sigma Xi, Society of Economic Geologists, Geological Society of America (fellow), Mineralogical Society of America (fellow), American Association for the Advancement of Science, American Association of Petroleum Geologists, American Institute of Mining, Metallurgical and Petroleum Engineers and Society of Economic Paleontologists and Mineralogists. Numerous committees of many of these and other organizations obtained his services, and in 1959 he was vice-president of the Association of American State Geologists and was president-elect of this organization at the time of his death.

His manifold interests were also manifest in his non-professional activities. He was active in the Austin Rotary Club, collected guns and loved to hunt on a deer lease held with a group of friends for over 15 years. Humble in demeanor, modest in word, and true in thought he was a devoted friend and a delightful companion. In recognition of his services to his country, his ashes have been interred at Arlington National Cemetery.

As these words are written at the desk in his study in the house that to him was home, in view of his books, guns and other belongings that, now upon his passing have reverted to inanimate matter, it is clear that this outline is but that. It remains for the memories of his friends to complete the picture. John Lonsdale is survived by a great sense of loss, by his wife, a sister and a brother and, though he had no sons, we, his students, also remain.

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MEMORIAL OF GRAHAM STEWART MacKENZIE

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The sudden passing of Graham Stewart MacKenzie on May 5, 1960 shocked and saddened his many friends who sincerely sympathize with his wife Alice, his two sons Blake and Ross, his father, four brothers and two sisters.

Graham MacKenzie was born in Toronto in 1905 but spent most of his early years in Winnipeg. He graduated from the University of Manitoba with the degree of Bachelor of Science in 1929. He attended the University of Toronto and received from there the degrees of Master of Arts and Doctor of Philosophy in 1930 and 1934 respectively. His Ph.D. thesis entitled "Some Post-Cambrian Mineral Deposits of the St. Lawrence Basin," involved a combination of his major interests; economic geology, mineralogy and chemistry.

From 1928 until the completion of his academic training at Toronto in 1934, he worked in the provinces of Manitoba, Ontario and Quebec. He gained from E. L. Bruce, J. M. Thompson and B. T. Denis excellent and interesting field training and experience which was to become so valuable to him during subsequent years as geologist and teacher. From these early travels and associations he also developed a collection of anecdotes and stories of the "bush" which never failed to interest and entertain his students and friends.

Graduating during the depression, Graham's qualities, experience and training served him well and he joined the staff of the Quebec Bureau of Mines where he worked under the direction of the late J. A. Dresser for whom he frequently expressed great respect and admiration.

In 1935 Alice Ross, originally of Bridgewater, N. S. became Mrs. Graham MacKenzie and during the next 25 years she graciously and quietly combined her natural social talents with those of her husband in a manner which made their home a friendly, informal and intellectually stimulating haven for students, professors, professional colleagues and the many friends who came to know and respect them through the years.

Graham joined the staff of the University of New Brunswick in 1937 and became Professor and Head of the Department of Geology in 1945. The Department grew rapidly in quality and numbers of students under his leadership, and during his last years, a program of post-graduate training and research was developed which gained for the department and the university, reputation and respect in many quarters. In 1957 students and former students organized a dinner and presentation to demonstrate in a simple but serious fashion their thanks for the many

'extra' kindnesses they had received from Graham and Alice MacKenzie.

He served his adopted province with enthusiasm and distinction in the field as well as in the classroom and laboratory. He worked for the federal and provincial surveys, unravelling some of the problems of Appalachian Geology in New Brunswick and always gave freely of his time to encourage, advise and assist those, either professional or amateur, interested in rocks and minerals.

The discovery of the large base metal deposits in Northern New Brunswick is rightly credited to an early program of exploration which Graham MacKenzie devised and directed. Although the material aspects of his life did not vary greatly as a result of his endeavors, his modest pride in achievement was a more important compensation.

It was however to his students that Graham devoted the bulk of his energies and his genuine interest and warm sympathy endeared him to faltering freshmen and aggressive graduates alike. His office door was always open and students of all departments found in "Doc" MacKenzie a willing, sincere, respected and capable confidant. His unselfish service to many worthy organizations and university committees reflected the respect and unassuming authority which he commanded from within and outside academic circles.

In part as recognition of his contribution of the discovery of the base metal deposits in the Bathurst-Newcastle camp, the University of New Brunswick conferred on him an honorary Doctorate in Science in 1953 and Mount Allison University granted him posthumously an honorary Doctorate in Law in May, 1960. He was a Fellow of the Royal Society of Canada, a Fellow of the Geological Association of Canada, a Member of the Canadian Institute of Mining and Metallurgy, a Fellow of the Mineralogical Society of America, a Member of the Mineralogical Association of Canada and the Canadian Institute of International Affairs. He also served the Canadian Advisory Committee on Research in the Geological Sciences.

Graham MacKenzie's warm friendliness, good humour, keen intelligence and modest mien will be remembered and missed especially by his students and colleagues within the much larger number of his friends and acquaintances.

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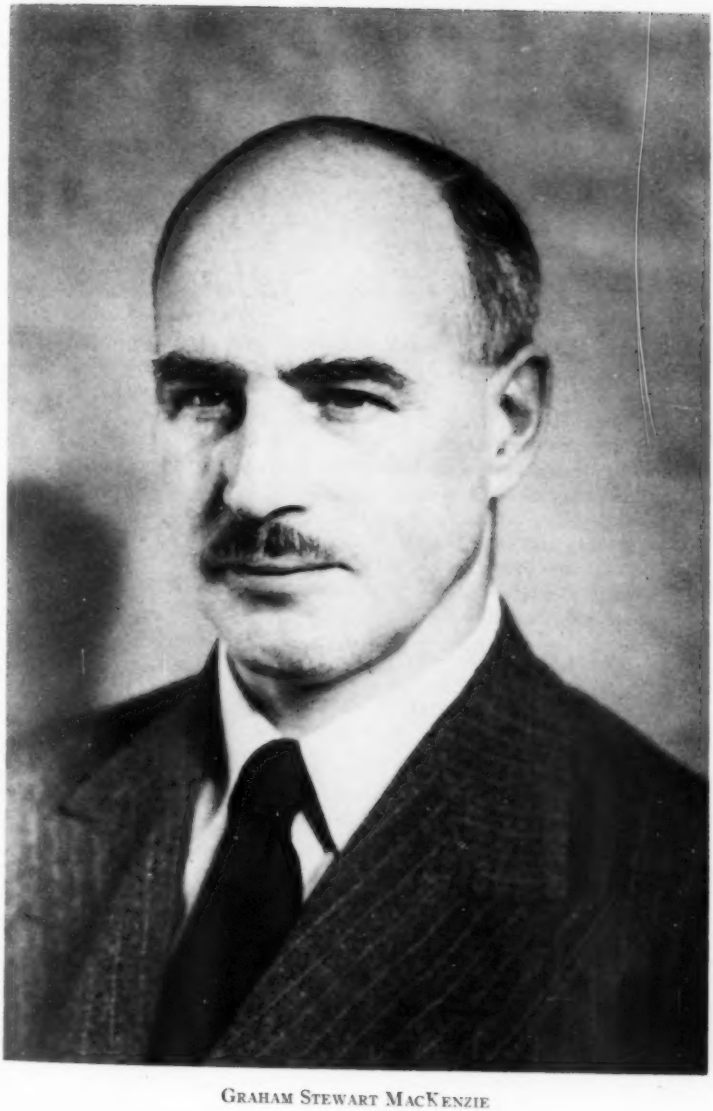

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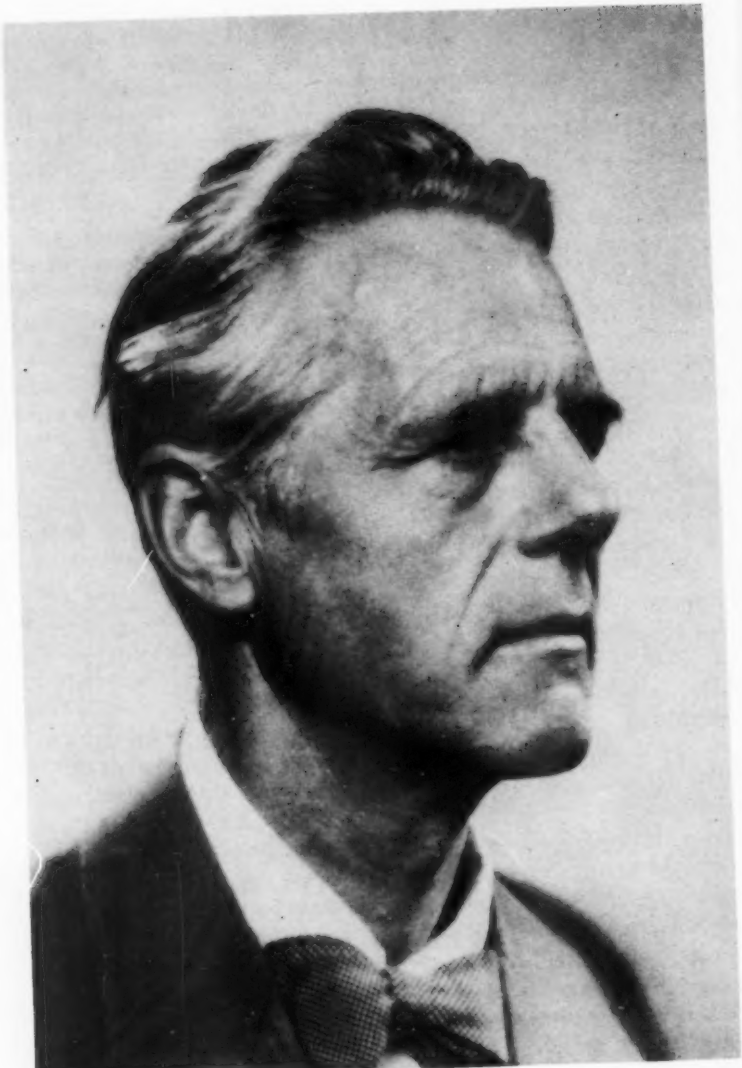
PRESENTATION OF THE ROEBLING MEDAL TO TOM. F. W. BARTH

GEORGE TUNELL, *University of California, Los Angeles, California.*

Mr. President, Fellows and Members of the Mineralogical Society of America, and Guests:

In 1936 the Council of the Mineralogical Society of America directed that a gold medal be designed in honor of Colonel Washington Augustus Roebling, a noted civil engineer who had long been interested in mineralogy and who had served as Vice-President of the Society in 1924. The Council further indicated that this medal was to be awarded for important contributions to the mineralogical sciences both in the United States and in other countries.

The award this year will be the nineteenth and the first to a Norwegian mineralogist. The person selected by the Council to be the recipient, Prof. Tom. F. W. Barth, was born in Norway in the town of Molde in 1899. A few months later he was taken to Bosekop, a small settlement near the North Cape, where he lived until he entered school at Trondhjem. In 1919 he entered the Royal Frederic's University in Oslo, and there became a student of Prof. W. C. Brøgger, whose investigations of the igneous rocks of the Oslo province are classical. As early as 1894 Brøgger had concluded that within a series of congenetic igneous rock types, the differentiation was determined by the laws of crystallization. From 1924 to 1927 Barth came under the stimulating influence of Prof. V. M. Goldschmidt and participated in some of Prof. Goldschmidt's researches on crystal structures and the geochemical distribution of the elements. In 1927 he received the degree of Doctor of Philosophy from Oslo University. In 1927 and 1928 he was an Assistant Professor in the Technische Hochschule in Berlin and in 1928 and 1929 he held a similar position in the University of Leipzig. From 1929 until 1936 he was a member of the scientific staff of the Geophysical Laboratory of the Carnegie Institution of Washington. In 1936 he returned to Norway to become a Professor in Oslo University and Director of the Mineralogisk Institutt, and he held these positions through the Second World War. For a time he was confined in a prison camp by the German army along with many other members of the University faculty, but his scientific research was continued in spite of many handicaps. In 1946 Dr. Barth joined the faculty of the University of Chicago as Professor of Geochemistry, but after three years he returned once more to his native land to assume the post of Director of the Mineralogisk-Geologisk Museum and to resume the position of Professor in Oslo University. Since then he has left Norway only briefly.



TOM. F. W. BARTH

Dr. Barth's researches have covered a wide range of subjects in mineralogy, petrology, and geochemistry. His *x*-ray study of perovskite and dysanalyte in 1925 showed that their atomic arrangement is a simple one of approximate cubic symmetry, but actually of lower symmetry. A few years later in collaboration with Dr. E. W. Posnjak he determined the atomic arrangement of ilmenite. Its structure is similar to that of hematite, but its symmetry was proved to be lower because an atom of titanium takes the place of every other iron atom in the hematite unit cell. A very comprehensive investigation of the structures of the spinel group of minerals and related artificial compounds was carried out by Dr. Barth and Dr. Posnjak in the course of which they discovered that, while some of these minerals have the classical type of structure described by W. H. Bragg and by S. Nishikawa for spinel and magnetite, on the other hand magnesioferrite and several related artificial compounds have a remarkably different structure. In magnesioferrite 8 of the trivalent iron ions occupy one set of equivalent positions and the other 8 trivalent iron ions together with the 8 divalent magnesium ions are statistically distributed over one set of equivalent positions in a disordered manner. Previous to the work of Barth and Posnjak it had not been recognized that in a pure chemical compound atoms or ions of two or more chemical elements might be distributed statistically in a disordered way over one set of equivalent positions. An *x*-ray investigation by Dr. Barth of the sodalite family of minerals in which variate atom equi-points are also present, cleared up confusion of long standing concerning the chemical formulas of noselite and haüyne and gave an accurate picture of the atomic arrangements in these minerals.

I have mentioned some of the *x*-ray researches of Prof. Barth first, because I am more cognizant of his crystallographic contributions than of his field investigations. From his student days, however, he has spent much time mapping the igneous and metamorphic rocks in numerous Norwegian and American areas and working out their petrogenetic relations. As a result of his studies of the plutonic rocks in the Oslo Province, Barth concluded that the development of the principal plutonic rock series of this Province was conditioned by the development of various mineral reaction series, particularly by the two reaction series of the feldspars.

He has also carried out extensive investigations of the granitic and gneissic rocks of southern Norway near Kristiansand and determined the approximate temperatures at which they were formed by the use of the distribution ratio of soda in coexisting feldspars as a temperature indicator. Barth's general conclusion is that the pre-Cambrian granites of southern Norway were mostly formed by anatexis, although there are

three granitic bodies in this region that exhibit sharp contacts and that crystallized at temperatures about 150° C. higher than those at which the encasing gneisses were metamorphosed; these three granitic masses he believes were emplaced as hot crystalline bodies. In a petrographic investigation of basalt lavas from many parts of the world Barth has shown that the various types have originated mainly by crystal fractionation, and he further demonstrated that in almost all basaltic lavas only one pyroxene is present, the composition of which shifted progressively from diopsidic to clinohypersthenic during the process of differentiation.

While Dr. Barth was a member of the staff of the Geophysical Laboratory, he became interested in the work of Dr. A. L. Day, Dr. E. T. Allen, and Dr. H. E. Merwin on the hot springs, geysers, and fumeroles of the Yellowstone National Park. With the encouragement and support of Dr. Day, who was at that time the Director of the Geophysical Laboratory, he undertook a comprehensive investigation of the volcanic activity, hot springs, and geysers in Iceland which is reported in a magnificently illustrated monograph constituting Carnegie Institution of Washington Publication Number 587. In the conclusion of this work Barth states that: "The volcanic hot springs of Iceland form an evolutionary series from acid to alkaline (pH 2→9). The acid springs are rich in 'volcanic' gases—hydrogen, hydrogen sulfide, and carbon dioxide—and contain very small amounts of nitrogen. In the course of evolution, hydrogen sulfide and hydrogen are consumed by wallrock alterations and by oxidation. Thus springs rich in carbon dioxide are formed. Eventually the carbon dioxide is consumed also, and springs emerging at great distances from the volcanic centers, for instance in Tertiary basalt, usually contain more than 99 per cent nitrogen plus argon. Such springs have clear water and show alkaline reaction." Barth's findings for the Icelandic hot springs are thus in very good agreement with those of Day, Allen, and Merwin for the hot springs of Yellowstone National Park.

I have attempted to touch upon but a few of Prof. Barth's scientific contributions, which are embodied in a long series of scientific papers, several monographs, and a well balanced treatise on petrology. His achievements have been recognized by the University of Copenhagen, which awarded him an honorary doctoral degree in 1950, and by the University of Nancy, which awarded him an honorary doctoral degree in 1960. In 1959, on his sixtieth birthday, the Norwegian government conferred upon Prof. Barth the Royal Order of St. Olav, the highest honor that it awards for civilian achievement. He is a fellow of the following royal academies: Norske Videnskaps Akademi, Oslo, Norway;

Kungliga Fysiografiska Sällskapet, Lund, Sweden; Kongelige Videnskabs-Selskab, Copenhagen, Denmark; Royal Society of Edinburgh, Scotland. He is an Honorary Member of the Geological Society of London, of the Geological Society of Belgium, and of the Geological Society of France, a Corresponding Member of the Geological Society of America and of the Geological Society of Finland, a Member of the Geological Society of Norway, of the Geological Society of Sweden, of the Geological Society of Denmark, of the Deutsche Mineralogische Gesellschaft, of the Geochemical Commission of the International Union of Chemistry (of which he was also President in 1957–1960), and of the Geochemical Society (of which he was also President in 1960). And finally he is a Fellow of the Indian Mineralogical Society and of the Mineralogical Society of America.

Mr. President: It is a great pleasure as well as a valued privilege to introduce my old friend and former colleague, Prof. Barth, for the award of the Roebling Medal.

PRESENTATION OF THE ROEBLING MEDAL BY PRESIDENT MURDOCH

Thomas Frederick Weybye Barth, geologist and mineralogist, distinguished for your investigations in a wide range of subjects, notably the *x*-ray determination of unusual crystal structures, the course of differentiation in basaltic lavas, and demonstration of the reaction series in the alkali feldspars: it is my pleasure as President of the Mineralogical Society of America to present to you the Roebling Medal in recognition of these achievements.

THE AMERICAN MINERALOGIST, VOL. 46, MARCH–APRIL, 1961

ACCEPTANCE OF THE ROEBLING MEDAL

T. F. W. BARTH.

President Murdoch, Dr. Tunell, Fellows, Members, Guests:

In the first book of Confucious which was written about 2500 years ago, there is a passage saying: "Isn't it a pleasure to have friends who come from far away to visit you." This year I have been visited by thoughts and by letters from friends who live far away.

When I received the letter from our president, Dr. Murdoch, stating that you had selected me as the recipient of the Roebling Medal, it was a message from the other side of the globe giving me a pleasant shock. After some reconsideration it occurred to me that it was not, perhaps, so much myself, as it was my teachers and friends in many lands whom the Council of the Society wanted to honor; for this, I thank you from a full heart.

It was easy for me to become a mineralogist. As a student I was fortunate to be associated with V. M. Goldschmidt in his most active period of life. I was fascinated by his genius and drank avidly from his cornucopia of new ideas in mineralogy and crystal chemistry.

Through him I was introduced to the best in German science; I lectured for two years in the department of Professor K. H. Scheumann whose wide interests and artistic abilities made a deep impression on me.

Still in my twenties, I was fortunate to receive an International Rockefeller grant (a rare dispensation at that time) to study at Harvard with R. A. Daly, Esper Larsen, Charles Palache and others. The kindness of these men and their inspired teaching kindled in me an enthusiasm and devotion to mineralogy that can never die.

To top my share of luck, I was soon accepted on the staff of the Geophysical Laboratoy in Washington, D. C.—another great opportunity for me. I want to mention Dr. A. L. Day, the director of the Laboratory, E. S. Shepherd, and certainly N. L. Bowen, whose original experiments and original ideas—as we all know—were revolutionary in the development of our field of science. Many years later Bowen also brought me back to America; this time to Chicago for a few years.

And last, but not least, I should mention Dr. H. S. Washington. He was dear to my heart, and I cherish his memory most affectionately. He was a perfect gentleman, cultured, handsome, with kind, clear brown eyes, and an impressive beard. He was the finest of scholars, and he taught me, not only science and research, but also ethics, wisdom and natural philosophy.

Finally, I have had to do something on my own account. For better or for worse, I have spent most of my time in Norway. I have enjoyed field work and mapped large areas of Precambrian rocks. Compelled by my own observations I have become a SOAK, in spite of my respect for V. M. Goldschmidt, my admiration for Bowen, and my warm feelings for Esper Larsen.

In conjunction with this work, I developed the two-feldspar geologic thermometer. It may need modification and perhaps the details are more complicated than pictured by me. But the principle is right. And it has been great fun. Dr. Washington said to me: "In order to do research it is necessary to have a particularly brilliant mind, or a very high intelligence. To be able to do good research is a state of mind." I hope that through him I have acquired that state of mind.

Mr. President, I cannot find adequate words. I am grateful for the Medal, and I want to express my sincere thanks to the Mineralogical Society of America. But only to these old teachers and friends of mine, goes the honor.

THE AMERICAN MINERALOGIST, VOL. 46, MARCH-APRIL, 1961

PRESENTATION OF THE 1960 MINERALOGICAL SOCIETY OF AMERICA AWARD TO DONALD L. GRAF

JULIAN R. GOLDSMITH, *University of Chicago, Chicago, Illinois.*

Mr. President, Fellows, and Members of the Mineralogical Society of America, and Guests:

Donald L. Graf is this year's recipient of the Mineralogical Society of America Award. In a presentation of this sort it is usually stated that the proceedings give a great deal of pleasure to the presentor. This must, in some people, be due to a pleasurable sensation produced by the inverse audiovisual experience, in others to a vicarious association with the person being honored, and in still others to a generally false feeling of equality or even superiority induced by their unique task and elevated attitude before an unparticipating and seated audience. Then there are those whose expressed feeling of pleasure is a downright lie.

How can I say that what I am doing is a pleasure? I am playing the part usually reserved for staid, mature, and what many of the younger people would even call "elderly" duffers. The Mineralogical Society of America Award has been called the young man's award. In 1955 I found myself in the seat Don now occupies. Can one find pleasure in having aged so in 5 short years?

Donald Graf received his undergraduate degree in Geologic Engineering at the Colorado School of Mines, and his M.A. and Ph.D. at Columbia University. His only place of business has been with the Illinois Geological Survery, since December, 1948. The 1960 Award is given to him for significant research on the calcium-magnesium carbonates. I shall not dwell on details of his work, but will assume that those really interested know them. I would rather quote to you directly from Oscar Hammerstein II, who said the following about Richard Rodgers:

"His melodies are clean and well defined. His scores are carefully built, logically allied to the stories and characters they describe. No overgrown forests or weed-clogged meadows of music here, but neat rows of tenderly grown flowers on well-kept lawns. Pseudo-artists and dilettante critics might interpret these comments as disparaging. The impulsive creator of overgrown forests of music might seem a more powerful and more important and more rugged fellow. Speaking for myself, I am bored with undisciplined talent. The intertwining vines and aimless vegetation that spring from careless genius are of little use to a world which suffers from obscurity, and not too much clarity. Life is so short that no musician has the right to expect any appreciable number of people to devote any appreciable part of their listening lives to the wild free notes that dribble from his talented but casual fingers. A large

DONALD F. GRAF

number of musical compositions, a large number of grand operas and light operas, are too long, too carelessly put together, and fail for this reason. They are not above the heads of the public. They are just not worthy of the public because the creative artist involved has been too self-indulgent actually to finish off his job."

Don not only has shown the ability of finishing off a piece of research very well indeed, but he has shown the growth and desire necessary to continue to attack new problems with new approaches. This Award is intended for a man whose accomplishments represent points on a rising curve, and I am sure that Don is a long way from an inflection.

Mr. President, I have the privilege of presenting to you, Dr. Donald L. Graf, as the 10th recipient of the Mineralogical Society of America Award.

PRESENTATION OF THE AWARD BY PRESIDENT MURDOCH

Donald Lee Graf, able and industrious worker through whose researches the complexities of the carbonate rocks are being untangled: it is my pleasure as President of the Mineralogical Society of America, to present to you the Society's Award for 1960, with the firm expectation that you will continue successfully to investigate this and other mineralogical problems.

THE AMERICAN MINERALOGIST, VOL. 46, MARCH-APRIL, 1961

ACCEPTANCE OF THE MINERALOGICAL SOCIETY OF AMERICA AWARD

DONALD L. GRAF, *Illinois State Geological Survey, Urbana, Illinois.*

I suppose we all wonder at times whether our activity in a particular corner of science is of any interest or use to anyone else. When no one comments on an error in a published paper, this can be more discourgaing than losing the argument that should have developed. Recognition from one's society, such as you have just bestowed upon me, is therefore particularly heartwarming as evidence of one's relationship to the larger scientific community. I appreciate very much the encouragement that you have given, and can only hope that in the years ahead it will prove to have been warranted.

It has been my good fortune to be employed by an organization, the Illinois State Geological Survey, that has generously supported a pro-

gram in my case divorced from routine tasks. I owe a great deal to having had the chance to work closely with Julian Goldsmith and W. F. Bradley. And, above all, I am indebted to John Haff who sought to explain to us at the Colorado School of Mines the nature of proof and the difference between quality and quantity, and who was responsible for sending me to work under Professor Kerr at Columbia University. Professor Haff once spent an hour explaining to us in vivid detail that we really knew nothing about anything. We were by then past masters at physical chemistry and integral calculus, and it was generally agreed that the professor was badly in error.

Dr. Goldsmith has suggested to you that I am interested in carbonates. This is true. More broadly, I am interested in applying physical and chemical techniques to understanding the mechanisms of equilibrium and nonequilibrium processes in sedimentary environments. A number of us have recently made a modest start toward a basin-wide study of the solids and liquids contained in the Pleistocene evaporite sequence of the Great Salt Lake Desert. The definitive constants in such studies, of course, must frequently be obtained at experimental temperatures and pressures well removed from those which exist in sediments and sedimentary rocks.

Rather than go on at length about research plans, however, I should like to comment on the professional atmosphere within mineralogy and geochemistry since World War II. In my experience it has been a time of remarkable generosity and openness, and of cooperative relationships springing up between widely separated people of diverse interests. The situation is surely the exact opposite of that which in the 1870's led Professor Leidy to conclude that, because of the activities of Marsh and Cope, vertebrate paleontology was no longer a fit occupation for gentlemen. I think, the absence of animosities of any consequence results not from the greater perfection of human beings in 1950 and 1960, but simply from the fact that earth scientists are seated at a mammoth banquet table and know and accept that fact. There are more worthwhile things to be done than any of us can hope to handle, even with the aid of 50 graduate students. The recent bursts of activity in the fields of solid state physics, isotopic chemistry, and marine sedimentation, for example, have opened whole new areas of activity for mineralogists and geochemists, and we are on the verge of extraterrestrial sampling.

Most of us come to the banquet table with a discouragingly small number of concepts and research techniques at our command, in comparison with the spectrum revealed, for example, by a single issue of *Chemical Abstracts*. This frustrating situation is for the most part inevitable, but earth scientists, nevertheless, have been making a determined

effort to achieve greater versatility. There has been a general tendency to plunge into new and enticing fields without exhaustive preparation but with a determination to subject the results of these excursions to severe scrutiny. After all, if Professor Haff was right about the general state of knowledge, there is less reason to be afraid of another man's field. This bursting of previously sacred frontiers allows a geoscientist these days to contemplate adventures in astronomy, chemistry, physics, mathematics, and zoology, in addition to geology. Professor Urey has pretty well covered the list. One is soon brought face to face with the realization that in addition to the old limitations of time, money, equipment, and personal intelligence, there is a highly variable personal limit to the rate at which one can learn new techniques and concepts and still remain happy and productive.

It is not only because of the fine personal relationships and the stimulating variety of problems at hand that I have enjoyed the past ten years spent in science. At the risk of seeming trite, I must emphasize that the long range viewpoint, the dedication to excellence, and the relatively objective standards of evaluation in science are qualities that I find missing in much of the world around me. These qualities were present to a very considerable degree in the Iowa farming villages where I grew up, and they still are.—If the members of the society are surprised at the comparison, I can only suggest that the astonishment in Iowa would probably be comparable.

Thank you very much.

PROCEEDINGS OF THE FORTY-FIRST ANNUAL MEETING OF THE MINERALOGICAL SOCIETY OF AMERICA AT DENVER, COLORADO

GEORGE SWITZER, *Secretary.*

The forty-first meeting of the Society was held on October 31–November 2, 1960, at the Denver Hilton Hotel, Denver, Colorado. The scientific sessions were integrated with those of the Geological Society of America and other affiliated Societies. A total of 43 scientific sessions were held. Of these two were devoted to mineralogy, one to crystallography, one to petrology, and four to geochemistry, at which 114 papers were presented.

The annual luncheon of the Society on November 1 was attended by 200 fellows, members and guests. Following the luncheon the eighteenth presentation of the Roebling Medal was made to T. F. W. Barth and the tenth presentation of the Mineralogical Society of America Award was made to Donald L. Graf.

On the afternoon of November 1, the Society was addressed by Retiring President Joseph Murdoch on the subject *Crestmore—Past and Present.* The annual business meeting was held on the morning of November 2, at which reports were given by the Secretary, Treasurer, and Editor. An announcement of an International Mineralogical Association meeting to be held in Washington, D. C., in April 1962 was made by International Mineralogical Association President, D. J. Fisher.

ACTION OF THE 1960 COUNCIL

The 1960 Council of the Society met on the afternoon and evening of October 30 and the morning of October 31 for a total of seven hours.

Mineralogical Abstracts. The International Mineralogical Association Abstracts Commission met in Copenhagen in August 1960 to discuss the ultimate goal of having an international abstracts journal. The most promising plan envisages the extension of *Mineralogical Abstracts*, presently owned jointly by the Mineralogical Society of America and the Mineralogical Society of Great Britain. To this end the following note was approved by the Councils of both societies, to be circularized by the Abstracts Commission to all known national societies or associations:

> During the Copenhagen meeting of the International Mineralogical Association the new Commission on Abstracts discussed the organization of a comprehensive journal of mineralogical abstracts.
>
> The most promising plan envisages the extension of *Mineralogical Abstracts*, at present owned jointly by the Mineralogical Society of Great Britain and the Mineralogical Society of America. With the approval of the Councils of both these societies, the Commission is sending this letter to all known national mineralogical societies in an effort to obtain their co-operation.
>
> I. *Mineralogical Abstracts* could be readily enlarged if more abstracts covering different countries were available. Regional or national societies can secure for all their members a 50% reduction in the cost by agreeing to contribute free of charge Engilsh abstracts comprising a comprehensive coverage of papers appearing in their region; they need undertake no other responsibility. Members of such societies would pay $4.50 (U. S.) for personal annual subscription to *Mineralogical Abstracts* compared with the full subscrption rate of $9.00. National mineralogical societies in Canada, Japan, Norway and Switzerland are already partaking in this scheme.
>
> II. The question of a wider ownership of *Mineralogical Abstracts* is being considered but the British and American societies feel that it woud be premature to extend

ownership prior to 1963. They feel that more experience of the present financial arrangement would be essential to devise an equitable scheme. Both the Brith and American societies put up appreciable capital sums in order to start *Mineralogical Abstracts* (as from vol. 14); moreover they have agreed to stand losses that *Mineralogical Abstracts* might incur. Members of the British society pay an annual subscription of the equivalent of $3.00 for *Mineralogical Abstracts* and this is included in their subscription to the *Mineralogical Magazine*, i.e. they cannot contract out of buying *Mineralogical Abstracts*. Members of the American society can purchase *Mineralogical Abstracts* for $3.00 which may be included in their dues at their discretion. The subscriptions appropriate to wider ownership would depend considerably on the number of participating countries.

Awards. The Council voted that in 1961 the Roebling Medal be awarded to Paul Ramdohr, and the Mineralogical Society of America Award be presented to Joseph V. Smith.

Election of Fellows. In 1960 there were 49 candidates for Fellow placed on the ballot. Following past procedures, the Secretary had printed a booklet giving biography and bibliography of each candidate. This required a 79 page booklet, and even though it was typed and produced by photo offset, the cost of preparing the booklet was nearly $700. The Secretary suggested that in the future a method patterned after that used by the Geological Society of America and the Society of Economic Geologist be followed: The following form was suggested and approved by the Council:

To the Fellows of the Society:

> The Secretary sends you herewith vita on the candidates on the enclosed ballot for election as Fellows. The candidates have been approved by the Council on recommendation by the Nominating Committee for Fellows. The complete bibliography of any candidate may be obtained by writing to the Secretary not later than August 1, 1961.

The vita on each candidate will consist of a brief biography, number of publications and general nature of major publications, and names of sponsors. This new short form will be followed in presenting candidates for election in 1961.

Financial Advisory Committee. The report of the Committee was accepted. The Council voted to drop the matter, raised the preceding year, of a commercial audit of the Society's books.

Membership List Publication. The Council voted that the Executive Committee bring to the 1961 Council recommendations for publishing the membership list separately by photo offset from adressograph plates.

Mistake in by-Laws. In November 1951 the Council recommended the following amendment in Article II, Section 3 of the By-Laws, and voted that it be placed on the ballot in 1952 for approval by the membership:

> Fellows and members who have reached the age of 70 years, or have reached the official retirement age of the institution in which they have been serving, and have paid annual dues for 30 years, shall be exempt from further payment of dues but retain all rights and privileges. (From Proceedings, *Am. Mineral.*, **37,** 276, 1952.)

This above item appeared on the ballot distributed to the membership in 1952, but the result of the vote does not appear in the Proceedings of the following year or in subsequent years, nor in the Secretary's reports to the Council in subsequent years.

There has been no authority for any change in the wording of Article II, Section 3 of the By-Laws between the time that it appeared on the ballot in 1952 and in the revision of the By-Laws approved by the Council in 1957 and printed in 1958 (*Am. Mineral.*, **43,** 611–614). Therefore, this section in the 1958 printing of the By-Laws is incorrect.

The Council feels that the simplest way to correct the mistake is to place Article II, Section 3 of the By-Laws, as originally worded and recommended by the Council in 1951, and (probably) voted by the membership in 1952, on the 1961 ballot to be reaffirmed and thereby annul the error in the wording of this section in the revised By-Laws approved in November 1958. The Council, therefore, voted that the above proposed change be placed on the 1961 ballot for vote by the membership.

Use of Mailing List. The Council voted that the present practice be continued of selling the MSA mailing list to concerns such as book publishers, if by so doing a service would be rendered to the membership, and that the charge to be made for the use of the list be left to the discretion of the Treasurer.

Storage of Back Issues of the American Mineralogist. The Council was informed by the Editor that the stock of most of the back issues of *The American Mineralogist*, now stored at the University of Michigan, must be moved within a year. The Council voted that the back issues be moved to Silver Spring, Maryland, and that storage, sales, and distribution of back issues be taken over by the Treasurer's office.

Funds for Travel to Annual Meeting. The Secretary pointed out that the 1946 Council authorized travel expenses of five cents per mile for the Secretary, Treasurer, and Editor to attend the annual meeting of the society. The Council reaffirmed this past Council action.

General Interest Articles in The American Mineralogist. Richard H. Jahns reported that he has compiled a list of 22 famous mineral localities, and is ready to inaugurate a series of articles of professional quality on famous mineral localities. The Council reiterated its approval of the project, and voted that Dr. Jahns and the Editor be empowered to use their best judgment in the selection of articles.

Action by the 1961 Council

Editor of The American Mineralogist. The Council appointed Lewis S. Ramsdell Editor of *The American Mineralogist* for the year 1961.

Co-Editor of The American Mineralogist. The Editor requested that the Council appoint a Co-Editor, to begin work immediately, and to take over full editorship of the journal at the end of 1961. The immediate duties of the Co-Editor would be to receive and evaluate all manuscripts, send them to referees, and to be responsible for all book reviews. These two functions represent about one-third of the editorial work load. The Council appointed E. W. Heinrich Co-Editor of *The American Mineralogist* for the year 1961.

American Geological Institute. The Council voted that the Mineralogical Society of America contribute no more than $500 to the American Geological Institute in 1961, at the will of the Executive Committee.

International Mineralogical Association. The Council voted that $150.00 be paid during 1961 as the Society's dues to the *International Mineralogical Association.*

Ten Year Index of The American Mineralogist. The Council voted that Joseph Murdoch be appointed Chief Indexer, to begin preparation of the next 10-year index of *The American Mineralogist*, for volumes 41–50.

International Mineralogical Association Meeting in Washington, D. C., in Spring 1962. The date of the meeting was set for April 18–20, 1962, with field excursions before and after the meeting. The Council voted that Alvin Van Valkenburg be appointed General Chairman of the local committee.

Archivist. The Society has never had an Archivist, and there is increasing danger as years pass that records relating to the Society's founding and early history will become lost. The Council voted that George T. Faust be appointed Archivist, and that he be requested to begin the task of assembling all pertinent papers and information.

Committee Appointments. President Osborn made the following committee appointments, which were approved by the Council:

1961 COMMITTEES OF THE MINERALOGICAL SOCIETY OF AMERICA

Nominating Committees for Fellows

R. Roy, *Chairman*	1960–62
E. N. Cameron	1959–61
J. L. Kulp	1959–61
C. F. Park, Jr.	1960–62
W. S. MacKenzie	1961–63
R. S. Cannon	1961–63

Roebling Medal Committee

R. M. Garrels, *Chairman*
C. A. Anderson
H. L. James
H. Kuno
C. E. Tilley
G. Tunell

Program Committee

H. Winchell
J. W. Peoples, alternate

Nominating Committee for Officers

C. L. Christ, *Chairman*
J. C. Griffiths
H. H. Hess
A. L. Howland
H. F. McMurdie
R. G. Coleman

Auditing Committee

A. Van Valkenburg, *Chairman*
M. L. Lindberg
G. L. Davis

Nomenclature Committee

J. V. Smith, *Chairman*	1959–61
G. Tunell	1959–61
G. T. Faust	1960–62
A. Pabst	1960–62
M. Fleischer	1961–63
C. Frondel	1961–63

MSA Award Committee

E. W. Nuffield, *Chairman*
W. F. Bradley
I. H. Milne
K. J. Murata
H. F. W. Taylor
J. B. Thompson

Financial Advisory Committee

E. P. Henderson, *Chairman*	1959–61
A. Montgomery	1960–62
W. T. Pecora	1961–63

Endowment Committee

C. B. Slawson

Advisory Committee on Russian Translations to the American Geological Institute

Earl Ingerson, *Chairman*

Representatives

American Geological Institute

Board of Directors:

R. M. Grogan	1960–61
J. F. Schairer	1961–62

Government Relations Committee:

P. F. Kerr	1959–61

International Mineralogical Association

Representative:
A. Pabst
Members of Commissions:
Abstracts—H. Winchell
Data—G. T. Faust
New Minerals and New Mineral Names—D. McConnell
Museums—G. Switzer
Teaching of Mineralogy—C. S. Hurlbut, Jr.

American Association for the Advancement of Science

P. F. Kerr
E. E. Wahlstrom

National Research Council

W. F. Bradley	1960–63

Nominations for Officers for 1962. The following slate was proposed by the Nominating Committee and approved by the Council:

President: Ian Campbell, California Division of Mines, San Francisco, Calif.
Vice-President: Cornelius S. Hurlbut, Jr., Harvard University, Cambridge, Mass.
Secretary: George Switzer, U. S. National Museum, Washington, D. C.
Treasurer: Marjorie Hooker, U. S. Geological Survey, Washington, D. C.
Councilors: (1962–64, two to be elected)

R. B. Ferguson, University of Manitoba, Winnipeg, Canada
Harold L. James, U. S. Geological Survey, Menlo Park, Calif.
Francis J. Turner, University of California, Berkeley, Calif.
Hatten S. Yoder, Jr., Geophysical Laboratory, Washington, D. C.

REPORT OF THE SECRETARY

To the Council of the Mineralogical Society of America

Election of Officers and Fellows

Nine hundred and forty-nine ballots were cast in the election of officers, 131 by Fellows and 818 by Members. The officers elected to serve in 1961 are:

President: E. F. Osborn, The Pennsylvania State University, University Park, Pennsylvania
Vice-President: Ian Campbell, State Division of Mines, San Francisco, California.
Secretary: George Switzer, U. S. National Museum, Washington, D. C.
Treasurer: Marjorie Hooker, U. S. Geological Survey, Washington, D. C.
Councilors: (1961–1963) Robert M. Garrels, Harvard University, Cambridge, Massachusetts.
O. F. Tuttle, The Pennsylvania State University, University Park, Pennsylvania.

According to the provisions of the Constitution, the following have been elected to fellowship:

John W. Adams, U. S. Geological Survey, Denver, Colorado.
George Baker, C.S.I.R.O., University of Melbourne, Parkville N. 2., Victoria, Australia.
Fernand A. J. Blondel, 18 rue Leonardo da Vince, Paris, France.
Esther W. Claffy, Naval Research Laboratory, Washington, D. C.
Robert G. Coleman, U. S. Geological Survey, Menlo Park, California.
William A. Deer, The University, Manchester, England.
Reynolds M. Denning, The University of Michigan, Ann Arbor, Michigan.
F. Donald Eckelmann, Brown University, Providence, Rhode Island.
Judith Weiss Frondel, 20 Beatrice Circle, Belmont, Massachusetts.
José M. Fuster, Museo Nacional Ciencias Naturales, Madrid, Spain.
William S. Fyfe, University of California, Berkeley, California.
John C. Hathaway, U. S. Geological Survey, Denver, Colorado.
Norman Herz, U. S. Geological Survey, A.P.O. 676, New York, N. Y.
Allen Van Heyl, Jr., U. S. Geological Survey, Washington, D. C.
Sven Hjelmqvist, The University, Lund, Sweden.
Floyd A. Hummel, The Pennsylvania State University, University Park, Pennsylvania.
Horst H. Kedesdy, Signal Research and Development Laboratory, Fort Monmouth, New Jersey.
Arthur W. G. Kingsbury, University Museum, Oxford, England.

Jack A. Kohn, Signal Research and Development Laboratory, Fort Monmouth, New Jersey.
James F. McAllister, U. S. Geological Survey, Menlo Park, California.
James L. McAtee, Jr., Baylor University, Waco, Texas.
*Graham S. MacKenzie, University of New Brunswick, Fredericton, New Brunswick. Canada.
Robert C. Mackenzie, Macaulay Institute for Soil Research, Aberdeen, Scotland.
Henry G. Midgley, Building Research Station, Harpenden Herts, England.
Louis Moyd, 136 Park Ave., Yonkers, New York.
Kaarlo J. Neuvonen, University of Turku, Turku, Finland.
Ernest H. Nickel, Department of Mines and Technical Surveys, Ottawa, Canada.
Ronald W. B. Nurse, Building Research Station, Harpenden, Herts, England.
Ke'ichi Omori, Tohoku University, Sendai, Japan.
Fred D. Ordway, Jr., National Bureau of Standards, Washington, D. C.
James Phemister, 19 Grange Terrace, Edinburgh, Scotland.
Alan T. Prince, Department of Mines and Technical Surveys, Ottawa, Canada.
Donald H. Richter, U. S. Geological Survey, Hawaii National Park, Hawaii.
George R. Rigby, Canadian Refractories, Ltd., Grenville, Quebec, Canada.
Gershon D. Robinson, U. S. Geological Survey, Denver, Colorado.
Harold P. Rooksby, The General Electric Company, Ltd., Wembley, Middlesex, England.
Chalmer J. Roy, Iowa State University, Ames, Iowa.
Edgar R. Segnit, C.S.I.R.O., Highett, Victoria, Australia.
Thomas W. Stern, U. S. Geological Survey, Washington, D. C.
Lorin R. Stieff, U. S. Geological Survey, Washington, D. C.
William Uytenbogaardt, Free University, Amsterdam, Netherlands.
John S. Vhay, U. S. Geological Survey, Spokane, Washington.
Ewart A. Vincent, University Museum, Oxford, England.
Oleg von Knorring, The University, Leeds, England.
Charlotte M. Warshaw, The Pennsylvania State University (3703 Stewart Drive, Chevy Chase, Maryland).
James White, University of Sheffield, Sheffield, England.
Ray E. Wilcox, U. S. Geological Survey, Denver, Colorado.
Allan F. Wilson, University of Queensland, St. Lucia, Brisbane, Australia.

* Deceased

Change in By-Laws

A proposed change in Article II of the By-Laws was passed by a vote of 640 for and 138 against. Article II of the By-Laws now stands as follows:

Article II—Dues

Section 1. The annual dues for members and fellows shall be eight dollars ($8) payable in January. Members who are students shall pay one-half the dues of other members.

Section 2. No person shall be accepted as a fellow of the Mineralogical Society of America unless he pays dues for the year within three months after notification of his election.

Membership Statistics

The membership of the society continues to grow, as shown in the following table:

	November 1, 1960		
	1958	1959	1960
Honorary Fellows	0	3	4
Fellows	360	376	419
Members	1,185	1,501	1,623
	1,545	1,880	2,046

During 1960 the society lost through death eight Fellows: Harold L. Alling, Ciro Andreatta, Harold E. Buckley, Burnham S. Colburn, Austin B. Edwards, Guerdon S. Holden, John T. Lonsdale, and Graham S. MacKenzie.

Respectfully submitted,
George Switzer, *Secretary*

REPORT OF THE TREASURER FOR 1960

(Year ending July 31, 1960)

To the Council of the Mineralogical Society of America:

Summary Statement

Cash on hand, August 1, 1959	$ 1,931.15	
Receipts, August 1, 1959–July 31, 1960	43,567.02	
Total	$ 45,498.17	$ 45,498.17
Disbursements, August 1, 1959–July 31, 1960	$ 34,924.09	
Transfer to capital	3,515.79	
Cash on hand, July 31, 1960	7,058.29	
Total	$ 45,498.17	45,498.17
Assets, July 31, 1960		
Cash on hand (as shown above)	$ 7,058.29	
Capital: Securities (market value)	151,285.00	
Endowment Fund cash	403.50	
Total	$158,746.79	158,746.79

RECEIPTS

Dues		
Fellows	$ 1,546.14	
Members	6,875.52	$ 8,421.66
Publications		
Geological Society of America grant	8,000.00	
Subscriptions to *American Mineralogist*	7,655.80	
Sale of reprints	3,285.78	
Sale of back numbers	2,706.87	
Sale of Index, vols. 31–40	852.00	
vols. 21–30	336.40	
vols. 1–20	176.20	
Advertising	1,779.13	
Mailing list	80.24	24,872.42
Endowment Fund		
Dividends and interest	7,214.61	
Fifty-Plus Committee	2,520.00	
Contributions	225.00	
Life Memberships	200.00	10,159.61
Special Funds		
Museum Fund	100.00	100.00
Exchange credits and collections	13.33	13.33
Total receipts		$43,567.02

DISBURSEMENTS

Honoraria		
Secretary (August 1, 1958–July 31, 1960)	$ 750.00	
Treasurer (November 15, 1958–July 31, 1960)	677.09	
Editor (April 1, 1959–March 31, 1960)	750.00	$ 2,177.09
Publications		
American Mineralogist (July 1959–April 1960)	22,616.03	
Reprints	3,570.40	
Program and abstracts	591.36	
Microtext of out-of-print issues	348.04	
Purchase of out-of-print issues	105.00	
National Science Foundation refund on index sales, May 1959–April 1960	744.50	
Postage and express	444.01	
Assistance	153.55	
Supplies	71.77	
Mailing list charge	26.37	
Subscription refunds	23.30	28,694.33

Office Expense		
Secretarial and clerical assistance	$ 895.40	
Officers' travel	48.00	
Printing	1,102.88	
Supplies	431.85	
Postage	705.04	
Telephone and telegrams	25.57	$ 3,208.74
International Mineralogical Association, 1960–61	150.00	
American Geological Institute, 1959–60	500.00	650.00
Roebling Medal (1959)	151.63	
MSA Award certificate	9.00	160.63
Checks returned	33.30	33.30
Total disbursements		$34,924.09

ENDOWMENT FUND

Amount	Security	Cost	Value[1]	Income[2]
	Bonds			
6M	Atlantic Coast Line, 4½	$ 5,257.50	$ 5,985	270.00
5M	New York Central, 5	4,300.00	3,438	250.00
5M	Southern Railway, 5	5,743.75	5,200	250.00
		$ 15,301.25	$ 14,623	$ 770.00
	Preferred stocks			
150	Fairbanks Whitney	$ 4,487.50	$ 3,431	$ 480.00[3]
60	Jones and Laughlin, A5	4,987.50	5,820	300.00
40	Potomac Electric Power, 2.44	2,000.00	1,940	97.60
200	Southern California Edison, 4.88	5,250.00	5,000	244.00
500	Union Pacific, 4	4,570.25	4,063	200.00
55	United States Steel, 7	6,946.20	7,865	385.00
50	Virginia Electric Power Co., 5	5,942.50	5,138	250.00
		$ 34,183.95	$ 33,257	$1,956.60

[1] Approximate market value, July 31, 1960.
[2] Fiscal year ending July 31, 1960, except where noted.
[3] Includes accumulated dividend.

	Common Stocks			
249	American Telephone and Telegraph	$ 11,255.98	$ 22,380	$ 821.72
50	Boston Insurance	1,500.00	1,694	90.00
100	Buckeye Steel Castings	3,800.00	2,675	150.00
177	Chase Manhattan Bank	11,281.25	10,797	181.20[4]
50	Chesapeake and Ohio Railway	2,368.75	2,944	200.00
300	Columbia Gas	5,174.72	5,963	265.00[5]
100	Columbus and Southern Ohio	2,087.50	4,725	165.00
150	Denison Mines, Ltd.	3,096.00	1,418	134.51
180	Diana Stores	2,800.30	3,150	180.00
210	Greyhound Corporation	2,300.00	4,645	210.00
261	Kroger Company	2,034.03	8,287	274.07
50	Phelps Dodge Corporation	1,975.00	2,425	150.00
100	Pittsburgh and West Virginia	2,787.50	1,238	—
100	Plymouth Cordage	4,750.00	5,750	290.00
350	Potomac Electric Power Co.	5,066.73	10,500	451.50
50	Public Service Electric and Gas	1,586.40	2,000	90.00
—	Sinclair Oil Corporation	—	—	150.00[6]
100	Southern Natural Gas	3,600.00	3,688	200.00
50	Spencer Kellogg	1,258.33	757	40.00
175	Standard Oil of New Jersey	1,761.65	7,131	393.75
60	United Fruit	3,067.50	1,238	15.00[7]
—	U. S. Playing Card	—	—	30.00[8]
	Merrill Lynch (interest)			6.26
		$ 73,551.64	$103,405	$4,488.01
	Total	$123,036.84	$151,285	$7,214.61
	Cash balance, Endowment Fund account, Riggs National Bank			403.50

[4] Additional shares purchased December 1959 and July 1960.
[5] Additional shares purchased December 1959.
[6] August 1959–July 1960. Sold in July 1960.
[7] One quarter dividend only.
[8] One quarter dividend. Sold in October 1959.

The summary statement and tables of figures show that the financial standing of the society has shown progress during the year and is satisfactory at the present time. We are faced, however, with several situations which bear directly on both our income and expenditures, and the solutions of some of these are not immediately evident. The comments that follow will elaborate the figures in the tables and relate them to the circumstances as they affect both our present and future position.

Income and Expense

The income is derived from three principal sources, either directly or from activity concerned with them.

Source	Amount	Per Cent 1959–60	Per Cent 1958–59
Dues	$ 8,421.66	19.4	18.2
Publication program	24,872.42	57.2	56.2
Endowment Fund	10,159.61	23.4	25.6

The percentages of income from these sources remain substantially the same as the previous year. The amount received in dues is $1000.00 more than last year, reflecting the continued rise in membership. The total agrees very well with the amount to be expected from a membership of 2000. The income from various parts of the publication program is apportioned about the same as last year. About 30% is derived from the sale of subscriptions to *The American Mineralogist*, amounting this year to $7655.80. At the present time, 1325 copies are distributed on a paid subscription basis; 517 are despatched within the United States to all fifty states and Puerto Rico; the other 808 are sent to 76 foreign countries. The figure for reprints, although larger this year, is only an apparent increase resulting from the distribution of payments in relation to the fiscal year. The income from the sale of indexes shows a 23% gain over last year. The figure for advertising represents income for more than one year due to a change in the method of invoicing; the portion for 1959–60 is larger due to an increase in both the amount of advertising and the rates. The total income from the Endowment Fund is of the same order as last year and will be discussed separately.

Expenditures are grouped as follows:

Item	Amount	Per Cent 1959–60	Per Cent 1958–59
Officers' honoraria	$ 2,177.09	6.2	3.2
Office expense	3,208.74	9.2	8.9
Publication program	28,694.33	82.3	85.3
Support of other organizations, etc.	810.63	2.3	2.6

The percentages of expenditures are also substantially the same as last year. Publication and related expense make up by far the major portion, with the printing and distribution of *The American Mineralogist* as the largest single item. Note should be made that the amount shown for this item at the close of the fiscal year covers only five issues; normal cost for six issues is approximately $27,000. The figure for officer's honoraria is higher than normally for it includes two years' payments to the Secretary and Treasurer as well as an increase in stipends. Office expense has remained at the same level in spite of increased business in the offices of the Editor, Secretary, and Treasurer. Of the unusually high amount for supplies, about 80% can be charged to the purchase of new record cards for the Treasurer's office for the decade 1961–70, an item recurring each ten years.

Endowment Fund

The book value of the Endowment Fund securities was $123,036.84 on July 31, 1960. Of this amount, 12.4% is in bonds, 27.8% in preferred stocks, and 59.8% in common stocks. The market value, computed on July 31, 1960, was $151,285.00. Funds invested during the year have been derived chiefly from payments on Fifty-Plus Committee pledges (see *The American Mineralogist*, May–June, 1960, pages 747–748, for statement and list of names). Dividends and interest accruing from the securities totaled $7214.61 and exceeded the estimated income of $6850 chiefly as a result of payment of accumulated dividends by the Fairbanks Whitney Corporation. From securities now held, an income of $7200 is estimated for 1960–1961. The percentage yield of the portfolio, and of each type of security, at both book and market values, is given below. These compare favorably with the current 3.4% average yield from industrial common stocks and the 4.6% average return on corporate bonds as reported by Merrill Lynch in August 1960.

	Yield			
	Total	Bonds	Preferred stock	Common stock
Book value	5.86	5.03	5.72	6.09
Market value	4.76	5.26	5.88	4.33

Mineralogical Abstracts

During 1959, the first year of co-publication of *Mineralogical Abstracts*, volume 14, numbers 1–4, was issued quarterly under the capable editorship of James Phemister. Copies were distributed to 683 members of the British society, 265 members of our society (in addition to about 260 who are members of the British society), and approximately 400 library subscribers. Total income from all 1959 subscriptions was about $6400.00 and the total cost of publication was about $11,400.00. Taking into account the initial joint contribution of $2800.00 (of which $500 had been used in 1958), that part of 1959 expense not covered by income amounted to $2700.00 ($1350 each society). In order to make *Mineralogical Abstracts* self-supporting, steps have been taken to reduce publication costs and to increase the income from subscriptions. These have resulted in some savings in cost, in spite of a 5% printer's increase as of January 1960, and enough of an increase in subscription revenue to make the overall picture for 1960 more assuring.

Income-Expenditure Outlook

It almost goes without saying that we are in the midst of a period of rising costs and that we must accept and resolve this fact. Our printing contract with George Banta Company, Inc. was rewritten this year to include a 6% increase to meet the higher cost of labor. Increases in membership and subscriptions, while admittedly desirable, bring with them increased expense, and we have had a net gain of 33% in the past 18 months. The Geological Society of America, in line with intentions outlined in November 1958, has found it necessary to initiate a schedule for the gradual decrease over a five-year period and termination in 1965 of our annual grant of $8000, given to us as an affiliated society to assist in publication of *The American Mineralogist*.

To maintain our ability to continue publication of *The American Mineralogist* and *Mineralogical Abstracts* at the present high standard, the Council has taken several actions. It has recommended that the membership approve an increase in dues for both fellows and members. It has approved the advance of the subscription price of *The American Mineralogist* to an annual rate of $10.00. In November 1959, it appointed an Advertising Manager to solicit more advertising for the *Journal*. Your Treasurer has also explored several smaller avenues for reducing costs and supplementing income. A postal permit, allowing special rates for domestic mailing, was secured this year. The schedule of reprint charges has been revised in line with our new printing contract. The strip announcement distributed with the annual dues bill has been responsible for the increased sale of indexes reported in the past two years. A comparable strip, sent to subscribers, has had a similar response with respect to index sales and has increased the number of subscriptions to *Mineralogical Abstracts*. A complete set of *The American Mineralogist*, with all out-of-print numbers, is now offered for sale. Other possible sources of income are being considered and the Treasurer will welcome suggestions from the membership.

During the past year, the Mineralogical Society of America received notification from the Internal Revenue Service of tax-exempt status as an educational and scientific organization. Contributions and bequests to the society are therefore deductible items under the

provisions of the Internal Revenue Code. The society was also notified by the Commissioners of Inland Revenue (Great Britain) that it had been placed on the list of societies approved for purposes of tax deductions by British members.

The Treasurer's office depends on several individuals for continuity of operation and I should like to place on record here my warm thanks to Catherine Skinner, for her able assistance with the records; Edward P. Henderson, Samuel S. Goldich, and Arthur Montgomery, of the Finance Committee, for their cooperation and competent advice; Stanly Carr and Herbert Allen, of Merrill Lynch, custodian of our securities; Irwin H. Wensink and Alvin A. Lang, of George Banta Company, Inc., printer of *The American Mineralogist*. And to those members of the society who have responded generously when called on for advice and assistance, a special thank you and my appreciation.

Respectfully submitted,
MARJORIE HOOKER, *Treasurer*

REPORT OF THE AUDITING COMMITTEE

To the President of the Mineralogical Society of America:

The Auditing Committee has examined and verified the accounts of the Treasurer of the Mineralogical Society of America for the fiscal year beginning August 1, 1959 and ending July 31, 1960. It is the Committee's opinion that the Treasurer has done an excellent job, and she should be commended for the admirable manner in which she has kept the Society's books.

Respectfully submitted,
MARIE L. LINDBERG
ALVIN VAN VALKENBURG
GUNNAR KULLERUD, *Chairman*

REPORT OF THE EDITOR FOR 1960

The 1960 volume of *The American Mineralogist* contained 1343 pages, very close to that of 1959, in both size and number of articles. There were 74 major and 65 shorter articles. The authors represented 28 U. S. educational institutions, 9 Federal agencies, and 11 private or industrial laboratories, 15 foreign educational institutions and 6 laboratories, giving a total of 69 institutions. Seven new minerals were described. There were 21 book reviews, and 72 items under Dr. Fleischer's valuable section on New Mineral Names.

The editor is grateful to the associate editors, and to many other individuals who have read manuscripts, and reported on them as to their suitability for *The American Mineralogist*. Likewise, the editor wishes to express his appreciation to the publisher of our *Journal*, George Banta Company, Inc. Their printing skill is evidenced by the excellent appearance of the *Journal*, and their splendid cooperation makes the editorial task much easier.

A summary of the contents of Vol. 45 is given in the following table.

DISTRIBUTION OF SUBJECT MATTER IN VOL. 45

Subjects	Number	Pages		% of Total
Leading articles	74	949		76.0
Short articles	65	211		16.8
			1,160	
Memorials	2	8		
Awards	2	11		
Society proceedings	1	21		
			40	3.2
Book Reviews	21	13		
New Mineral Names	72	31		
Notes	20	7		
			51	4.0
Total			1,251	100.0
Membership list			66	
Index, Title Page, Table of Contents			26	
Grand Total			1,343	

Respectfully submitted,
LEWIS S. RAMSDELL, *Editor*

LIST OF FORMER OFFICERS AND MEETING PLACES

By recommendation of the Council, a complete list of past officers is printed in the proceedings of the annual meeting of the Society:

HONORARY PRESIDENTS

Edward S. Dana 1925–1935
Charles Palache 1949–1954
Edward H. Kraus 1955–

PRESIDENTS

1920 Edward H. Kraus
1921 Charles Palache
1922 Thomas L. Walker
1923 Edgar T. Wherry

VICE-PRESIDENTS

1920 Thomas L. Walker
1921 Waldemar T. Schaller
1922 Frederick A. Canfield
1923 George F. Kunz

PRESIDENTS (*Cont.*)

1924 Henry S. Washington
1925 Arthur S. Eakle
1926 Waldemar T. Schaller
1927 Austin F. Rogers
1928 Esper S. Larsen
1929 Arthur L. Parsons
1930 Herbert E. Merwin
1931 Alexander H. Phillips
1932 Alexander N. Winchell
1933 Herbert P. Whitlock
1934 John E. Wolff
1935 Clarence S. Ross
1936 William S. Bayley
1937 Norman L. Bowen
1938 Ellis Thomson
1939 Max N. Short
1940 William F. Foshag
1941 Frederick E. Wright
1942 Arthur F. Buddington
1943 John F. Schairer
1944 R. C. Emmons
1945 Kenneth K. Landes
1946 Paul F. Kerr
1947 M. J. Buerger
1948 M. A. Peacock
1949 John W. Gruner
1950 George Tunell
1951 A. Pabst
1952 Michael Fleischer
1953 J. D. H. Donnay
1954 Sterling B. Hendricks
1955 Harry H. Hess
1956 Clifford Frondel
1957 D. Jerome Fisher
1958 George E. Goodspeed
1959 Ralph E. Grim
1960 Joseph Murdoch

VICE-PRESIDENTS (*Cont.*)

1924 Washington A. Roebling
1925 Herbert P. Whitlock
1926 George Vaux, Jr.
1927 George L. English
1928 Lazard Cahn
1929 Edward Wigglesworth
1930 John E. Wolff
1931 William F. Foshag
1932 Joseph L. Gillson
1933 Frank B. Guild
1934 William A. Tarr
1935 Ellis Thomson
1936 Harold L. Alling
1937 H. V. Ellsworth
1938 Kenneth K. Landes
1939 Burnham S. Colburn
1940 Ian Campbell
1941 William J. McCaughey
1942 Martin J. Buerger
1943 John W. Gruner
1944 Harry Berman
1945 George Tunell
1946 S. B. Hendricks
1947 Carl Tolman
1948 Adolf Pabst
1949 J. D. H. Donnay
1950 Ralph E. Grim
1951 Michael Fleischer
1952 J. D. H. Donnay
1953 Sterling B. Hendricks
1954 Harry H. Hess
1955 Clifford Frondel
1956 D. Jerome Fisher
1957 George E. Goodspeed
1958 Ralph E. Grim
1959 Joseph Murdoch
1960 E. F. Osborn

SECRETARIES

1920–1922 Herbert P. Whitlock
1923–1933 Frank R. Van Horn
1933–1934 Albert P. Peck
1934–1944 Paul F. Kerry
1944–1959 C. S. Hurlbut, Jr.
1959– George Switzer

TREASURERS

1920–1923 Albert B. Peck
1924–1929 Alexander H. Phillips
1929–1930 Albert B. Peck
1930–1940 Waldemar T. Schaller
1941–1958 Earl Ingerson
1958– Marjorie Hooker

EDITORS

1920–1921 Edgar T. Wherry
1922–1956 Walter F. Hunt
1957—Lewis S. Ramsdell

COUNCILORS

1920 Arthur S. Eakle, Frank R. Van Horn, Fred E. Wright, Alexander H. Phillips.
1921 Frank R. Van Horn, Fred E. Wright, Alexander H. Phillips, Austin F. Rogers.
1922 Fred E. Wright, Alexander H. Phillips, Austin F. Rogers, Thomas L. Watson.
1923 Alexander H. Phillips, Austin F. Rogers, Thomas L. Watson, Esper S. Larsen.
1924 Austin F. Rogers, Thomas L. Watson, Esper S. Larsen, Arthur L. Parsons.
1925 Thomas L. Watson, Esper S. Larsen, Arthur L. Parsons, William F. Foshag.
1926 Esper S. Larsen, Arthur L. Parsons, William F. Foshag, William A. Tarr.
1927 Arthur L. Parsons, William F. Foshag, William A. Tarr, Alexander N. Winchell.
1928 William F. Foshag, William A. Tarr, Alexander N. Winchell, Ellis Thomson.
1929 William A. Tarr, Alexander N. Winchell, Ellis Thomson, Clarence S. Ross.
1930 Alexander N. Winchell, Ellis Thomson, Clarence S. Ross, Paul F. Kerr.
1931 Ellis Thomson, Clarence S. Ross, Paul F. Kerr, William S. Bayley.
1932 Clarence S. Ross, Paul F. Kerr, William S. Bayley, William M. McCaughey.
1933 Paul F. Kerr, William S. Bayley, William J. McCaughey, Kenneth K. Landes.
1934 William S. Bayley, William J. McCaughey, Kenneth K. Landes, E. P. Henderson.
1935 William J. McCaughey, Kenneth K. Landes, E. P. Henderson, J. F. Schaierer.
1936 Kenneth K. Landes, E. P. Henderson, J. F. Schairer, Arthur F. Buddington.
1937 E. P. Henderson, J. F. Schairer, Arthur F. Buddington, Arthur P. Honess.
1938 J. F. Schairer, Arthur F. Buddington, Arthur P. Honess, R. C. Emmons.
1939 Arthur F. Buddington, Arthur P. Honess, R. C. Emmons, Carl Tolman.
1940 Arthur P. Honess, R. C. Emmons, Carl Tolman, D. Jerome Fisher.
1941 R. C. Emmons, Carl Tolman, D. Jerome Fisher, Martin A. Peacock.
1942 Carl Tolman, D. Jerome Fisher, Martin A. Peacock, Adolf Pabst.
1943 D. Jerome Fisher, Martin A. Peacock, Adolf Pabst, C. S. Hurlbut, Jr.
1944 Martin A. Peacock, Adolf Pabst, Michiel Fleischer, S. J. Shand.
1945 Adolf Pabst, Michael Fleischer, S. J. Shand, R. E. Grim.
1946 Michael Fleischer, S. J. Shand, R. E. Grim, Joseph Murdoch.
1947 S. J. Shand, R. E. Grim, Joseph Murdoch, H. H. Hess.
1948 R. E. Grim, Joseph Murdoch, H. H. Hess, Clifford Frondel.
1949 Joseph Murdoch, H. H. Hess, Clifford Frondel, Lewis S. Ramsdell.
1950 H. H. Hess, Clifford Frondel, Lewis S. Ramsdell, E. F. Osborn.
1951 Clifford Frondel, Lewis S. Ramsdell, E. F. Osborn, George T. Faust.
1952 Lewis S. Ramsdell, E. F. Osborn, George T. Faust, Victor T. Allen.
1953 E. F. Osborn, George T. Faust, Victor T. Allen, C. Osborn Hutton.
1954 George T. Faust, Victor T. Allen, C. Osborne Hutton, Felix Chayes.
1955 Victor T. Allen, C. Osborne Hutton, Felix Chayes, L. G. Berry.
1956 C. Osborne Hutton, Felix Chayes, L. G. Berry, C. B. Slawson, A. O. Woodford.
1957 Felix Chayes, L. G. Berry, C. B. Slawson, A. O. Woodford, S. S. Goldich.
1958 L. G. Berry, C. B. Slawson, A. O. Woodford, S. S. Goldich, B. H. Mason, R. H. Jahns, C. Milton.
1959 S. S. Goldich, B. H. Mason, R. H. Jahns, C. Milton, W. R. Foster, E. W. Nuffield.
1960 R. H. Jahns, C. Milton, W. R. Foster, E. W. Nuffield, J. R. Goldsmith, Horace Winchell

Annual Meeting Places

1920 Chicago, Illinois
1921 Amherst, Massachusetts
1922 Ann Arbor, Michigan
1923 Washington, D. C.
1924 Ithaca, New York
1925 New Haven, Connecticut

ANNUAL MEETING PLACES (*Cont.*)

1926 Madison, Wisconsin
1927 Cleveland, Ohio
1928 New York, N. Y.
1929 Washington, D. C.
1930 Toronto, Canada
1931 Tulsa, Oklahoma
1932 Cambridge, Massachusetts
1933 Chicago, Illinois
1934 Rochester, New York
1935 New York, N. Y.
1936 Cincinnati, Ohio
1937 Washington, D. C.
1938 New York, N. Y.
1939 Minneapolis, Minnesota
1940 Austin, Texas
1941 Boston, Massachusetts
1942 No meeting held
1943 No meeting held
1944 No meeting held
1945 Pittsburgh, Pennsylvania
1946 Chicago, Illinois
1947 Ottawa, Canada
1948 New York, N. Y.
1949 El Paso, Texas
1950 Washington, D. C.
1951 Detroit, Michigan
1952 Boston, Massachusetts
1953 Toronto, Canada
1954 Los Angeles, California
1955 New Orleans, Louisiana
1956 Minneapolis, Minnesota
1957 Atlantic City, New Jersey
1958 St. Louis, Missouri
1959 Pittsburgh, Pennsylvania
1960 Denver, Colorado

Recipients of the Roebling Medal

1937 Charles Palache
1938 Waldemar T. Schaller
1940 Leonard James Spencer
1941 Esper S. Larsen, Jr.
1945 Edward H. Kraus
1946 Charence S. Ross
1947 Paul Niggli
1948 William Lawrence Bragg
1949 Herbert E. Merwin
1950 Norman L. Bowen
1952 Fred E. Wright
1953 William F. Foshag
1954 Cecil Edgar Tilley
1955 Alexander N. Winchell
1956 Arthur F. Buddington
1957 Walter F. Hunt
1958 Martin J. Buerger
1959 Felix Machatschki
1960 Tom. F. W. Barth

Recipients of the Mineralogical Society of American Award

1951 Orville F. Tuttle
1952 Frederick H. Stewart
1953 L. H. Ahrens
1954 Hatten S. Yoder, Jr.
1955 Julian R. Goldsmith
1956 George C. Kennedy
1957 Rustum Roy
1958 Charles E. Weaver
1959 Harry F. W. Taylor
1960 Donald L. Graf

1960 ANNUAL MEETING AT DENVER, COLORADO

The meetings of the following societies were held on October 30–November 2, 1960.

The Geological Society of America—73rd
The Paleontological Society—52nd
The Mineralogical Society of America—41st
Society of Economic Geologists—41st
The Geochemical Society—5th

Abstracts of the papers presented are printed in the Bulletin of the Geological Society of America, Vol. 71, Number 12, Part 2, pp. 1811–2010.